

PERQ HARDWARE



PROCESSOR

PERQ includes a high speed microprogrammed 16-bit CPU with high level language directed architecture and integrated I/O controllers. The microcode supports a P-code byte sequence that a compiler generates for an "ideal" PASCAL (or other structured language) machine. The PERQ processor executes in excess of 1 million P-codes per second, 10-20 times faster than conventional interpreted P-code. The instruction set is modifiable so that additional language can be supported without compromising execution speed. A writable control store option is available for users to do their own language development, or to optimize application programs. The microcycle time is 170ns.

DISPLAY

Every PERQ workstation includes a high resolution graphics display. A 768 point by 1024 line, bit mapped, raster scanned image is displayed on a 15" CRT with portrait orienta-

tion (long side vertical). The screen surface is approximately 8½ x 11 inches, the same size as a standard page. The display is not interlaced—all 1024 lines are refreshed 60 times per second to provide a flicker-free, high resolution presentation.

The display bit map occupies a part of main memory, and special hardware and microcode in the processor facilitate rapid manipulation of the image. For text, characters are "painted" into the bit map from a software defined font which can be any size, shape or complexity. Multiple fonts are supported as well as proportionally spaced characters to give the screen typeset quality.

MEMORY

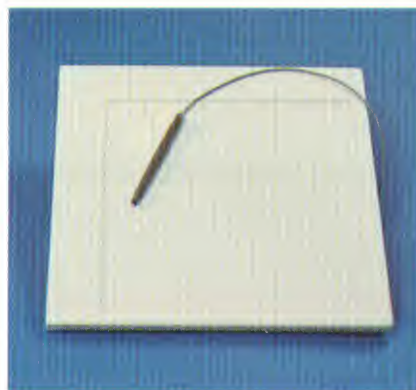
256 kilobytes of RAM with 680ns (average) cycle time is provided. A 1 megabyte RAM option will be available. PERQ's memory system features a virtual addressing mechanism with segmentation, swapping and a 32 bit address space. A parity option is available for the RAM.

KEYBOARD

PERQ features a 60-key, high quality, solid state detachable keyboard with good "feel," N-key rollover and autorepeat. The straightforward typewriter layout has large tab and return keys.

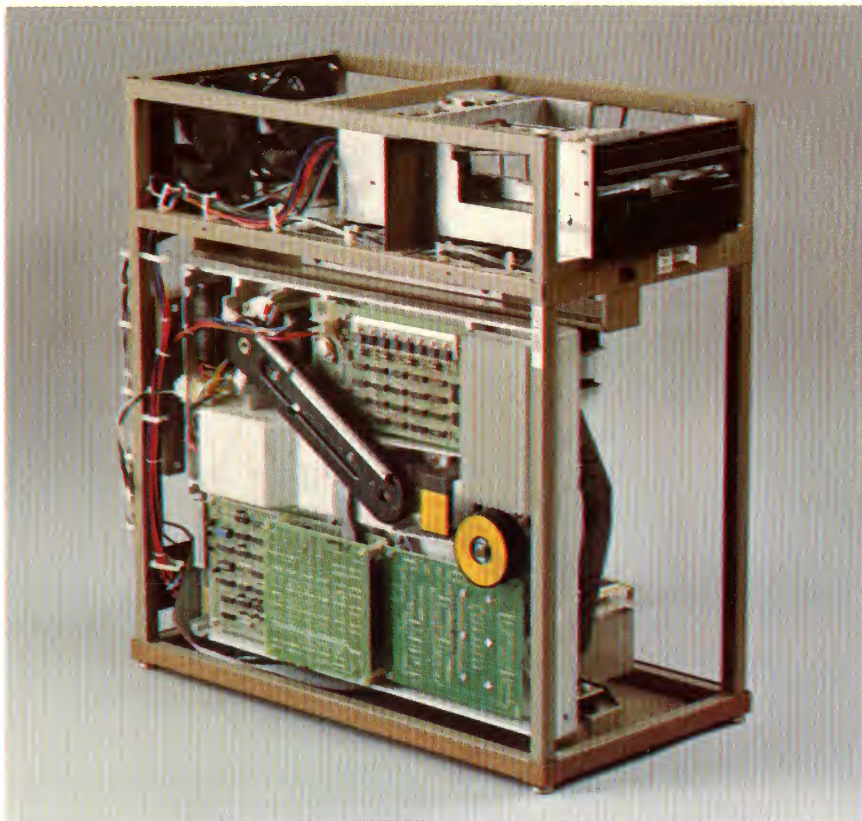
POINTING DEVICE

The on-screen cursor is positioned via an easy to use pointing device. This pen or puck operated device is used to select and manipulate items on the display. As the user moves the stylus on the surface, the cursor moves to track the position of the stylus. This mechanism is simple, reliable, and easy to use.



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DISK

PERQ has a built-in 12 megabyte (formatted) rigid disk. The 14" disk uses Winchester technology with 87ms average access time and 7 megabit/sec transfer rate. The medium is non-removable. As an option 24 megabyte capacity is available. Also available is a double sided, IBM compatible floppy disk drive.

NETWORK

Local Communications can be achieved via the fully compatible 10Mbit/sec Ethernet* option. Up to 1024 PERQs can be interconnected on a single coaxial cable, with a maximum distance of 2.5km. Broadcasting packets of data at 10 megabits per second, the network allows one PERQ to access data on another system. The

network is also used to provide access to shared resources such as printers and tape drives which cannot be economically provided to each work-station. By connecting a resource to one PERQ on a network, all other PERQ work-stations can share that resource.

RS-232 COMMUNICATIONS

PERQ includes a single full duplex bit stream at up to 9600 baud. Line and protocol parameters are programmable.

GPIB INTERFACE

PERQ provides a IEEE 488-1975 standard implementation of the General Purpose Instrumentation Bus. The GPIB provides a simple, compatible way

of interfacing a wide range of medium speed peripherals, as well as laboratory facilities, production test equipment and instrumentation.

SPEECH SYNTHESIZER

A Continuously Variable Slope Delta Modulator is used to provide arbitrary stored speech output. Pre-recorded CVSD data is stored on the system disk for voice response, audible signaling, and other speech applications.

*Ethernet is a trademark of Xerox Corporation.



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SOFTWARE HIGHLIGHTS



PASCAL COMPILER

A full PASCAL compiler is included with all PERQ systems. All Three Rivers supplied software is written in PASCAL. The language is extended with strings, separate compilation facilities, exceptional conditions, constant expressions, "others" clause, and additional predefined types.

EDITOR

The standard PERQ editor is a very sophisticated document manipulation system which displays on the screen an image of the document as faithfully as possible. PERQ's editor uses select-and-act sequences in which the pointer is used to select text to be manipulated, followed by entering the desired command. The Editor can easily handle large files.

OPERATING SYSTEM

PERQ is provided with a comprehensive operating system designed to provide a single user with a rich program development environment. The PERQ Operating System provides job management, virtual memory association, swapping, I/O services, File System, Window (Screen) Manager, Timekeeping functions, and PASCAL Routine Support.

Operating System modules are accessible at all levels to user programs via exported declarations. Security is provided with user login/password and multi-level file system security features. The operating system is mature, documented.

FILE SYSTEM

PERQ has a hierarchical, multi-directory file system which

supports search lists and non-contiguous files. Random access devices are divided into a number of sections called partitions. Each partition can contain any number of directories, and each directory may contain other directories or files. Directories are stored as standard files and can be accessed by any program. To maximize disk utilization neither files nor blocks within files need be on contiguous disk sectors. PERQ's file system design stresses reliability. All critical retrieval information is redundantly stored, and verification checks on disk operations insure the integrity of files. A special scavenger program can reconstruct damaged disk structures if necessary.

DISPLAY WINDOW MANAGER

All PERQ systems use the display window manager to manipulate screen information. The window manager partitions the screen into separate areas of windows. Windows may be moved around the screen, enlarged or contracted in two dimensions and scrolled, all under user control. Windows can overlap each other and can be as large as the entire screen or as small as a postage stamp.

NETWORK SUPPORT

PERQ will support a fully Ethernet* compatible 10Mbit/sec local network. It can also be used as a communications vehicle to other systems or as a pipeline to remote resources such as printers, tape drives, large file systems, etc.

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SOFTWARE HIGHLIGHTS

COMMAND INTERPRETER

PERQ's Operating System features a replaceable outer level Command Interpreter which includes support for Command Files.

OTHER UTILITIES

PERQ is delivered with over 30 Utility Programs, including Directory Creation and Search, File Copy, Rename, Type, Print, and Delete Operations, Patch, Terminal Emulation, Disassembly, plus several demo programs. When PERQ's optional writable control store is ordered, a Micro Assembler, Placer and Debugger is included.

PERQ software is delivered fully supported, as licensed software binaries. Supported software source licenses are optionally available.



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